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DR. GRANVILLE
ON
EGYPTIAN MUMMIES

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L. D. Fowler of Salisbury

with the regards of the Author

AN

ESSAY ON EGYPTIAN MUMMIES;

WITH

OBSERVATIONS ON THE ART OF EMBALMING AMONG THE ANCIENT EGYPTIANS.

BY

A. B. GRANVILLE, M. D.

F.R.S; F.L.S; F.G.S; M.R.I;

ONE OF HIS ROYAL HIGHNESS THE DUKE OF CLARENCE'S PHYSICIANS IN ORDINARY, &c. &c.

From the PHILOSOPHICAL TRANSACTIONS.

LONDON:

PRINTED BY W. NICOL, CLEVELAND-ROW, ST. JAMES'S.

1825.

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By Order of the President and Council,

W. T. BRANDE, Sec. R. S.

AN

ESSAY ON EGYPTIAN MUMMIES, &c.

Read before the ROYAL SOCIETY, *April* 14, 1825.

IN the year 1821, SIR ARCHIBALD EDMONSTONE, whose interesting work on two of the Oäses of Upper Egypt has been so favourably received by the public, presented me with a mummy, which he had purchased at Gournou, on the 24th of March, 1819, from one of the inhabitants of the sepulchral excavations on the side of the mountain, at the back of which are the celebrated tombs of the kings of Thebes. It cost about four dollars. There was no outer case to it; and it is difficult to conceive how the beauty and perfect condition of the surface of the single case in which the mummy was inclosed, could have been so well preserved without any external covering. It appears from Sir ARCHIBALD'S testimony, confirmed by my own observations, that the mummies which have a second, or an outer case, like the one bought at the same time by Sir ARCHIBALD EDMONDSTONE'S fellow traveller, Mr. HOGHTON, and now lying unopened at his seat near Preston, in Lancashire, have been folded, externally, with greater care than the one about to be described; and that the outward folds are ornamented with variegated stripes of linen. These observations accord with those made by JOMARD and ROYER.

The first, or inner case, too, of those mummies is covered with a kind of paper, on which the figures and hieroglyphics are painted with much greater brilliancy of colour. Similar remarks apply to the mummy presented to the Hunterian Museum at Glasgow, by Mr. HEYWOOD, a Smyrna merchant, the second or inner case of which is said to be of wonderful beauty and brilliancy.

The single case of the mummy which I am about to describe, appears to be made of sycamore wood, two inches in thickness, consisting of two equal portions (anterior and posterior, as the case is made to stand on its feet) fastened together by pegs of the same material. It is covered, inside and out, with a kind of shell, or coat of plaster, or lime, of considerable thickness. Externally, this coat is painted with symbols and hieroglyphics running in horizontal and longitudinal lines laid on a deep orange ground, the whole being highly varnished. Internally, the surface is divided into horizontal broad stripes, except at the sides, where the stripes run in a perpendicular direction. These stripes are alternately white and yellow, and on both are inscribed hieroglyphic characters an inch in length, constituting, to all appearance, one continued composition; probably a prayer, or invocation for the dead; or the biographical record of the individual contained within the case.

The form of the case is that known to belong to most of the Egyptian mummies brought to Europe, and will be better understood by inspection of Plate XVIII. fig. 1. It measures six feet five-tenths of an inch in its greatest length; and its circumference taken at three different points, the superior or shoulders, the central, and the inferior, immediately

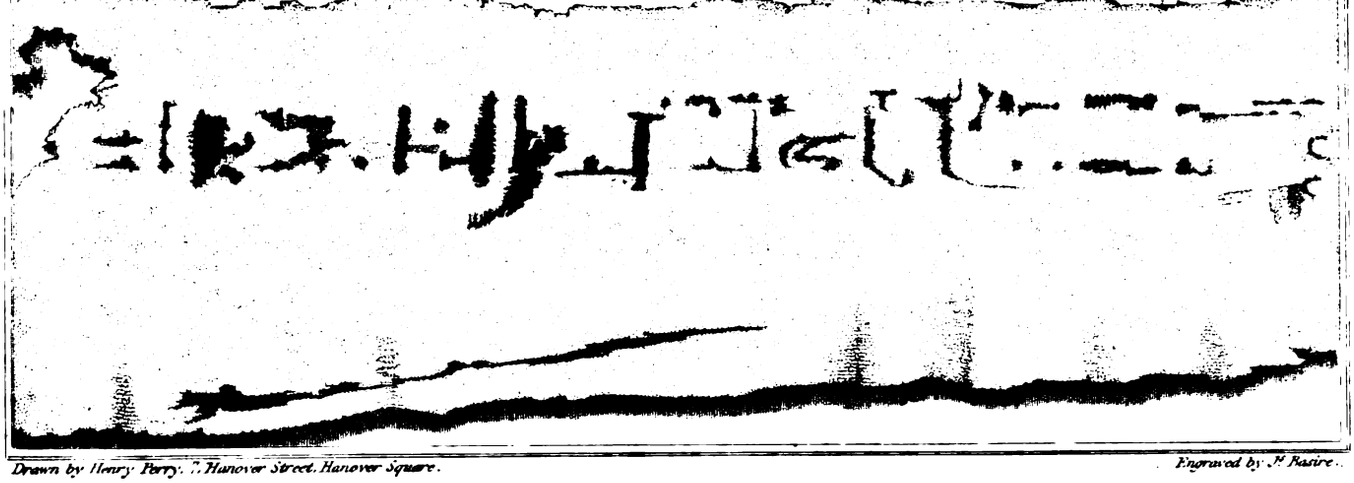
Fig. 1.



Fig. 2.



Fig. 3.



Drawn by Henry Perry, 7, Hanover Street, Hanover Square.

Engraved by M. Basire.

above the feet, is 5 ft. 2 in., 4 ft. 11 $\frac{3}{10}$ in., 3 ft. 8 $\frac{6}{10}$ in. The case is now deposited at my house.

When the mummy came into my possession, it was precisely in the state in which it was found when the case was first opened by Sir ARCHIBALD EDMONDSTONE, covered with cerecloth and bandages most skilfully arranged, and applied with a neatness and precision, that would baffle even the imitative power of the most adroit surgeon of the present day. There is no species of bandage which ancient or modern surgery has devised, described, or employed, that did not appear to have been used in securing the surface of the mummy from external air; and these are repeated so many times, that on weighing the whole mass of them after their removal, they were found to weigh twenty-eight pounds avoirdupois.

In unravelling these complicated envelopes in the presence of two or three medical friends, and Sir ARCHIBALD himself, we could not but be struck with the precision with which the circular, the spiral, the uniting, the retaining, the expellent, and the creeping roller had been applied. The neatness of the turns, and the judicious selection of their size, length, and forms, in order to adapt them to the different parts intended to be protected, and calculated so as to give to the whole an air of smoothness without a wrinkle, or the least appearance of slackness from the varying form of the limbs, were really surprising. We here met with the *couvrechef*, the scapularium, the 18-tailed bandage, the T bandage, as well as the *linteum scissum*, and *capistrum*. Nor were we less pleased to find the many pieces of neatly folded linen, placed like compresses, in all those parts of the body,

which, presenting natural depressions, or hollows, would, unless thus filled up, have proved as many obstacles to the firm and steady application of the bandages. Each limb, nay, each finger and toe, had a separate bandage next to the skin.

These observations respecting the art of bandaging among the ancient inhabitants of Egypt, as displayed in their best class of mummies, have not, as far as I recollect, been made before to the extent here alluded to, and will throw a new light on the history of that branch of practical surgery.

The principal rollers appear to be made of a very compact, yet elastic linen, some of them from four to five yards in length, without any stitch or seam in any part of them. There were also some large square pieces thrown around the head, thorax and abdomen, of a less elastic texture. These pieces were found to alternate with the complete swathing of the whole body. They occurred four distinct times; while the bandaging, with rollers and other fasciæ, was repeated, at least, twenty times.

The numerous bandages by which the mummy was thus enveloped, were themselves wholly covered by a roller three inches and a half wide and eleven yards long, which, after making a few turns around both feet, ascended in graceful spirals to the head, whence descending again as far as the breast, it was fixed there. The termination of this outer roller is remarkable for the loose threads hanging from it in the shape of a fringe, and for certain traces of characters imprinted on it, similar to those described and delineated by JOMARD in the *Description de l'Egypte*. One or two of these

characters have corroded the linen, leaving the perforated traces of their form. A fac-simile of this curious fragment will be found in Plate XVIII. fig. 3.

Besides this outer fascia, there was another bandage thrown over the head, brought in front of the chest, crossed there, and carried behind the back, where, being crossed also, it was again brought in front to be once more crossed and returned backward, and ultimately stretched from behind, before, down to the feet, where it crossed a third time in the manner delineated with great precision in Plate XVIII. fig. 2. The shape, form, and position of the limbs lay thus completely concealed, the mummy presenting a homogeneous outline resembling an elongated oval, the superior end of which was twice the width of the inferior.

There was, besides, laid upon the face, above the bandages, a thick mass of linen, by no means neatly folded up, covered by a considerable layer of a black bituminous substance, which became soft on long exposure to moisture, but which, while in that situation, most effectually concealed the features: so that in the present instance, there appears to have existed no desire in the surviving relatives to preserve the lineaments of a cherished friend, as must have been the case with regard to those mummies described by more than one author, in which the bandages applied to the head, had been so skilfully managed as to retain every feature of the face.

The other remaining observations with which I shall trouble the Society on the subject of these bandages, have reference to the materials of which they are made, and the substance with which they seem to be impregnated.

I have satisfied myself that both cotton and linen have been employed in the preparation of our mummy, although HERODOTUS mentions only cotton (*Byssus*) as the material used for the purpose. Most mummies have been described as wholly enveloped in linen cloth, and some persons are disposed to doubt the existence of cotton cloth in any, not excepting in the one now under consideration.

But with respect to the last point, a simple experiment has, I think, set the question at rest. If the surface of old linen, and of old cotton cloth be rubbed briskly and for some minutes with a rounded piece of glass or ivory, after being washed and freed from all extraneous matter, the former will be found to have acquired considerable lustre; while the latter will present no other difference than that of having the threads flattened by the operation. By means of this test I selected several pieces of cotton cloth from among the many bandages of our mummy, which I submitted to the inspection of an experienced manufacturer, who declared them to be of that material.

Having removed, after an operation of upwards of an hour, the various envelopes of the mummy, I directed my attention to its anatomical condition and state of preservation.

It was at once ascertained that the subject was a female, and that no ventral incision, as described by HERODOTUS, had been practised to extract the viscera.

The external parts of generation, on which not a vestige of hair was found, had been brought in close contact, and notwithstanding their shrivelled condition, were readily recognised. The mammæ must have been large during life, for they were found to extend as low down as the 7th

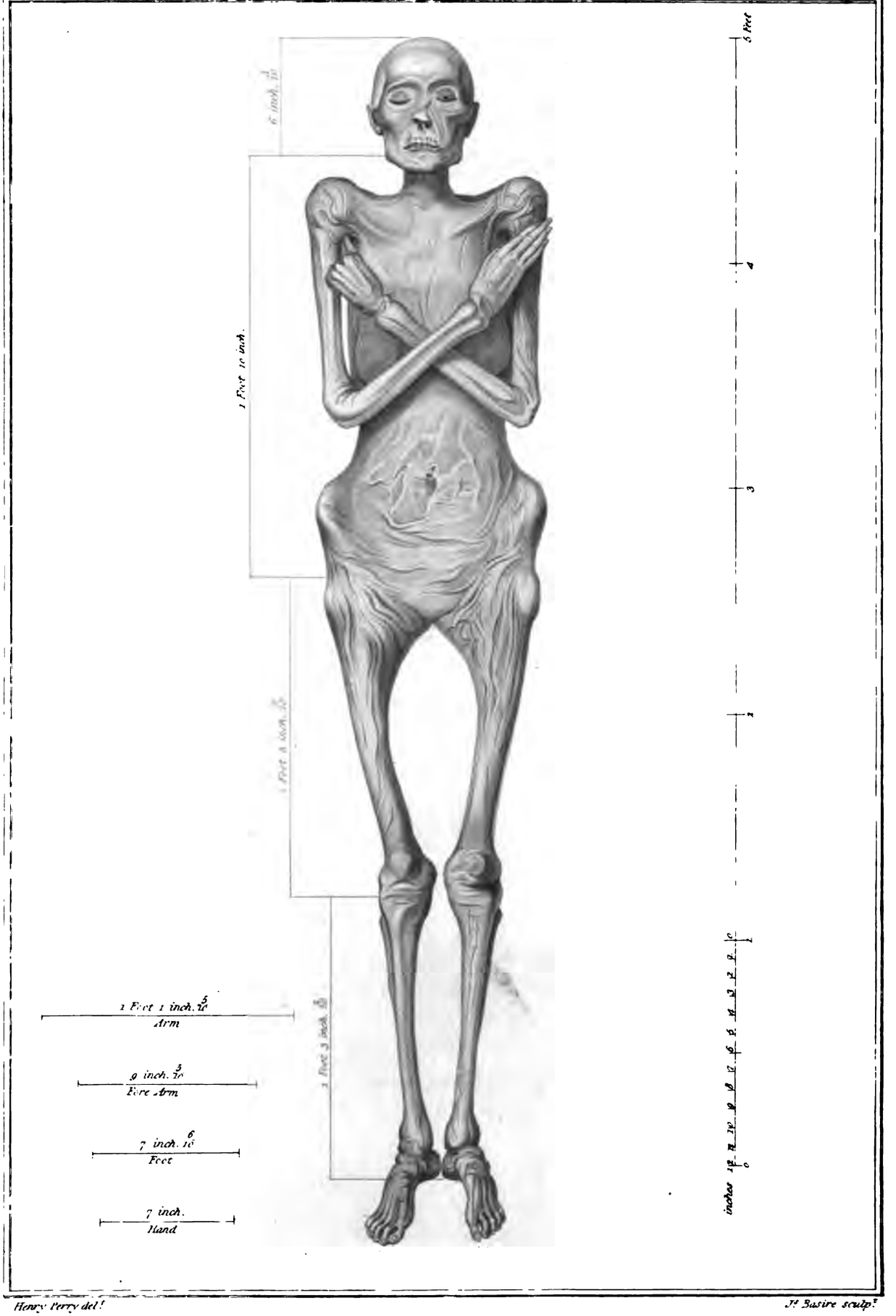
rib, against which they are closely pressed by the arms passing over them. But on lifting the latter, the breasts themselves were raised with little exertion. Of these organs there remain, of course, little more than the integuments, which are of considerable thickness, and exhibit the nipples with their surrounding areolæ in a perfectly distinct manner.

The head is closely shaved; the short hair, which is of a brown colour, can be felt on passing the hand over it; and on close inspection, may be distinctly seen. Externally the cranium appears not to have been disturbed in any way. The eyelids were in close contact. The nose has been flattened down towards the right cheek, by the action of the bandages. The lips, from being retracted, allow the teeth of the upper and lower jaw to be seen, perfectly white and in a sound condition. The arms are crossed over the chest, the fore arms directed obliquely upwards, towards the extremities of the shoulders. The fingers of the left hand alone were bent inwardly, the thumb remaining extended. No papyrus, or other object of interest was found within the grasp of the left hand, but a mere lump of rags which had been previously dipped in the same bituminous substance observed in other portions of the envelopes.

It is well known that papyri, idols, and other objects have been found placed under the arm pits of some of the mummies; but here nothing of the sort was discovered. Only a few glass beads of a blue and green colour, and bugles in all respects similar to those which decorate the dresses of our modern ladies, and made of the same material, dropped from between some of the folds of the bandages, while we unrolled them, as if they had been thrown in gra-

tuitously during the operation, by workmen who had been employing a large quantity of the same ornaments in preparing some more costly mummy, such as is described by JOMARD. It will be recollected, that this gentleman found some mummies in which glass bugles and beads in profusion, disposed in a sort of *trellis-work*, imbedded on bituminous substance, had been fixed here and there, over the surface of the body, in obedience, no doubt, to instructions received to that effect from the opulent surviving relatives. I am the more inclined to adopt the above conjecture with regard to the presence of the few beads and bugles found in my mummy, from the circumstance of my having found, likewise, a portion of reddish clay with characters painted on it, (either a fragment of the wall of the chamber in which the embalmers were at work, or of some case belonging to another mummy) placed in such a manner as to act as a compress on the inside of the left leg in contact with the skin Here it served to fill up a hollow which it accurately fitted; thus keeping the bandage, which passed over it, perfectly tight, but which would otherwise have been slack. This instance of indifference in the choice of materials to produce a particular end, on the part of the embalmers, would, in my opinion, account also for the accidental presence of the beads; and renders it unnecessary to seek for any learned or recondite explanation of their object.

Following up my description of the external appearances of our mummy, I have to remark that the inferior extremities were brought together in close contact at the knees and feet, which latter were kept in that position by a contrivance similar to that which obtains to this very day in most parts



Henry Perry del.

J.S Basire sculp.

of Europe, of fastening the two great toes by means of a piece of rag or tape.

Numerous and deep wrinkles appeared on the integuments of the abdomen, denoting that before death, this part of the body must have had very considerable dimensions; a conjecture, the correctness of which subsequent inquiries have completely demonstrated.

All these general appearances are well marked in Plate XIX.

The general surface of the body is of a deep brown colour, approaching to black, and is quite dry. In parts where the larger muscles lie, as the thighs for instance, the surface feels quite soft to the touch, and the muscles yield slightly to pressure. The cuticle appears to have been removed throughout, except at the extreme points of the fingers and toes, where it can yet be seen curled up, retaining the nails, of a deep brown colour, in their situation. Some of these, however, quitted their fastening when the slightest attempt was made to detach them.

The dimensions of the mummy appeared to me to deserve the next consideration; and they were taken with great accuracy. Such an opportunity as that before me, of ascertaining the size and proportions of an Egyptian woman, who had probably lived before the building of the pyramids of Memphis, could not be allowed to escape; especially as no admeasurement of a really perfect female mummy has been recorded in modern times. I deemed it, therefore, an object of importance in the study of the natural history of man, to have those admeasurements ascertained with precision. It is well known, that the Egyptian form has been assumed as

the type of a specific variety of the Ethiopian race, particularly by the venerable BLUMENBACH, from certain supposed peculiarities of outward conformation. The consideration of what follows will enable us, as far as a solitary instance can do, to judge of the correctness of such conjectural generalizations.

	Feet	In.
Height of the mummy from the vertex of the head to the inferior surface of the calcaneum	5	$0.\frac{7}{10}$

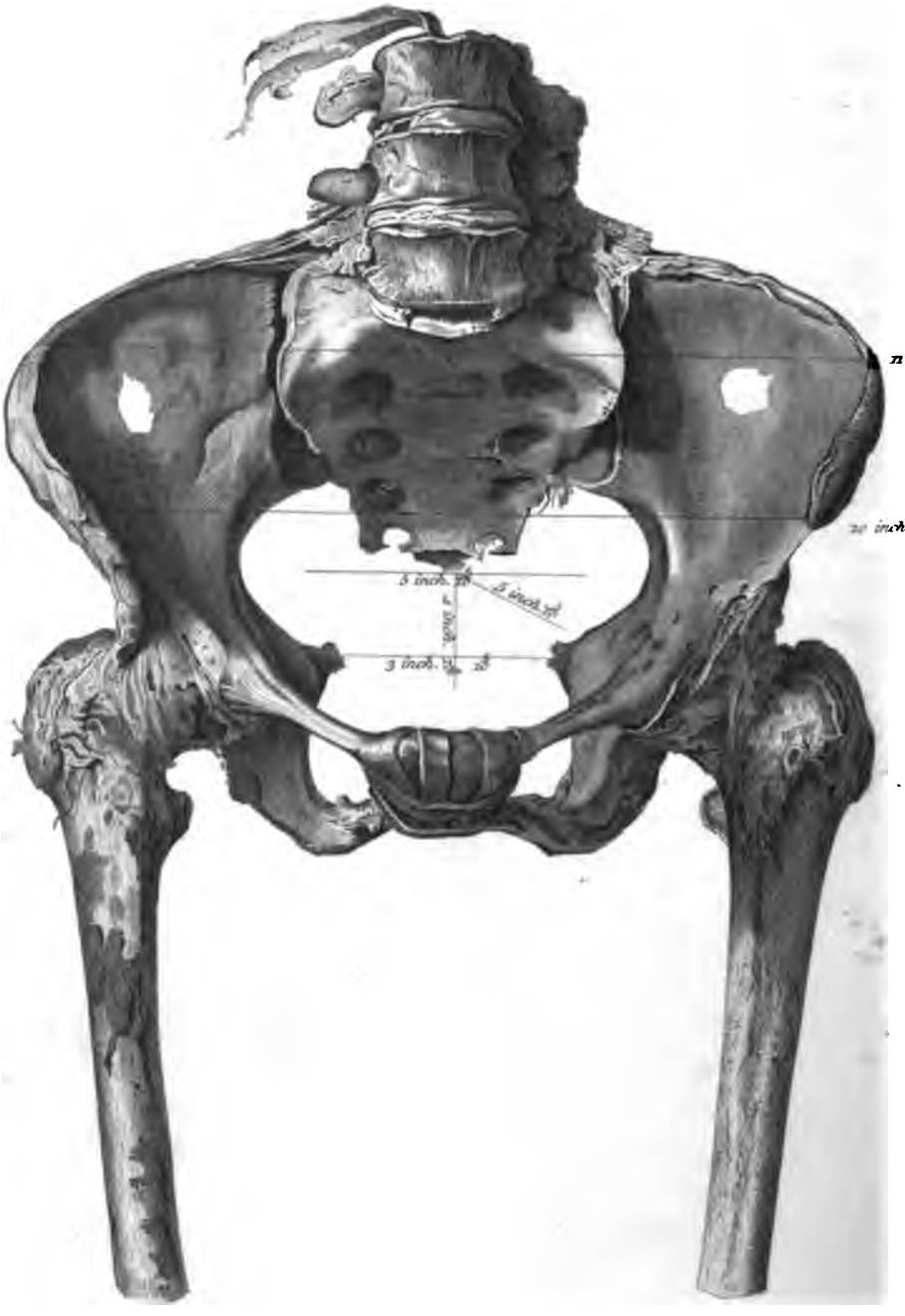
Thus divided.

Length of the head from the vertex to the first vertebra of the neck	0	$6.\frac{8}{10}$
Length of the back bone from the first vertebra of the neck, to the articulation of the os sacrum with the os coccygis	1	10
Length of the thigh from the centre of the head of the femur to the centre of the knee pan	1	$5.\frac{5}{10}$
Length of the leg from the centre of the knee pan to the inferior surface of the calcaneum	1	$3.\frac{8}{10}$
Total	5	$0.\frac{7}{10}$

The dimensions of the upper extremities and of the foot, are these:

	Feet.	Inch.		
Length of the arm	1	$1.\frac{5}{10}$	2	6.
——— of the fore arm	0	$9.\frac{5}{10}$		
——— of the hand from the tip of the middle finger, to the articulation at the wrist	0	7		
Length of the foot	0	$7.\frac{8}{10}$.		

These dimensions will be found accurately marked in Plate XIX.



Henry Perry del.

J. Basire sculp.

Now we find, on comparing the principal of these dimensions, with those of the Venus de Medicis, as given by WINKELMAN, CAMPER, and others, that the difference between them is so slight, as not to deserve notice. Our mummy is that of a person rather taller. The celebrated Medicean statue, which stands as the representative of a perfect beauty, is five feet in height, like our mummy, and the relative admeasurements of the arm, fore-arm, and hand in each, are precisely similar.

But in a female skeleton, it is the pelvis that presents the most striking difference in different races. Nothing, for instance, can be farther removed from the symmetrical form, and from the dimensions of the pelvis in the Caucasian or European race, than the same part in the Negro or Ethiopian race. Of this fact, I shall be able to convince such of the Fellows of this Society, as are not conversant in these matters, by exhibiting the most perfect pelvis of a well grown Negro girl, which I prepared some years ago, in contrast with that of our mummy, which I likewise carefully dissected, and caused to be represented by the same accurate artist in Plate XX. When subjected to this comparative test, the pelvis of our female mummy will be found to come nearer to the *beau idéal* of the Caucasian structure, than does that of women of Europe in general, and to equal in depth, amplitude, and rotundity of outlines, the Circassian form.

In illustration of this remark, I made the following measurements.

Greatest distance or width of the pelvis from the highest point of the ridge of the ilium on one side, to that of the other side.	In. 11.$\frac{5}{16}$

	In.
Distance between the two anterio-superior spinous processes of the ilia	10
Distance between the tuberosities of the ischium	3.$\frac{1}{8}$
Elevation of the branches of the ischium to join the descending branches of the pubis, and form the sub-pubian arch	3
Greatest elevation of the os innominatum or haunch bone, from the tubera of the ischium to the highest point of the crest of the ilia	8

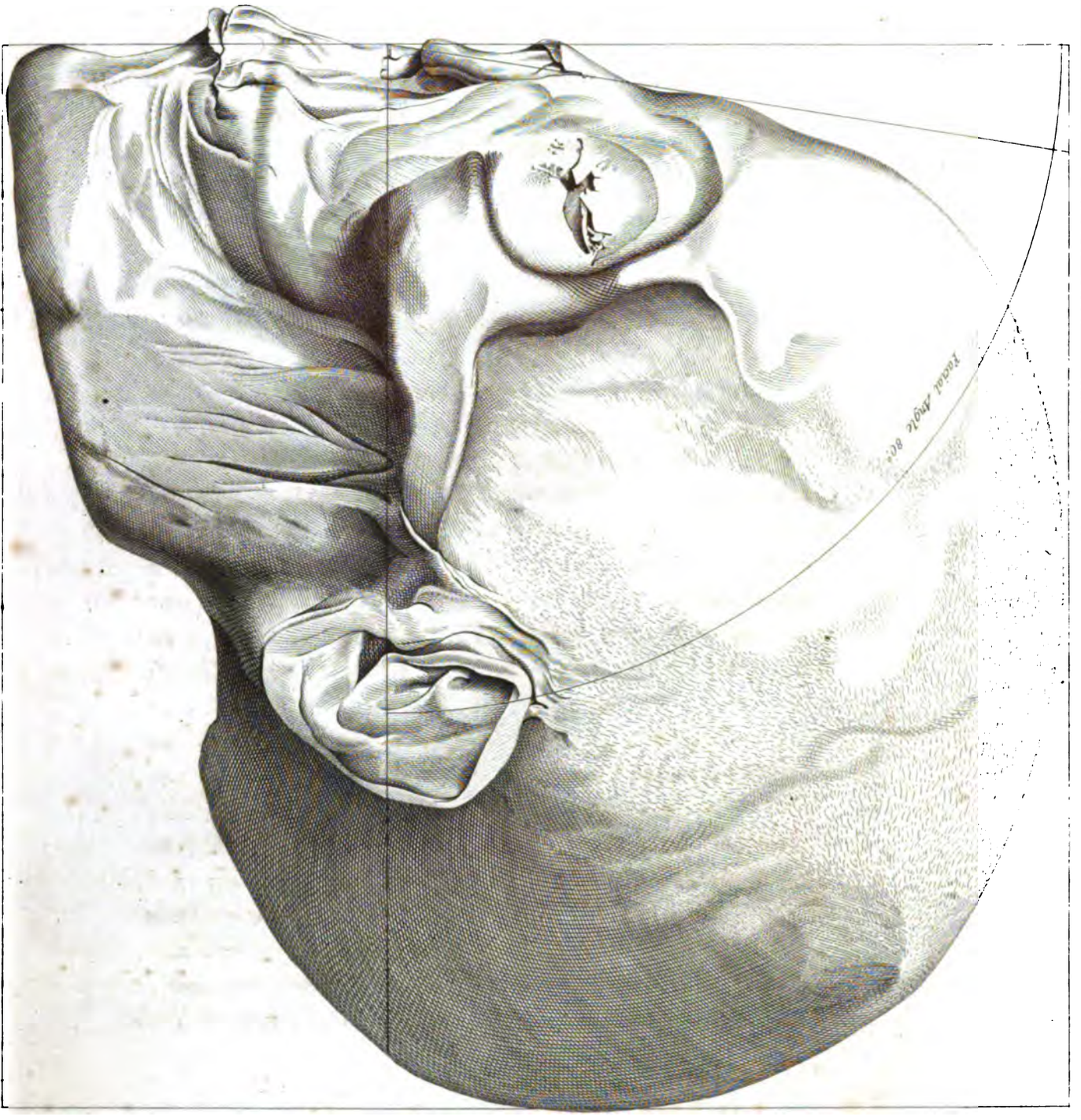
Diameter of the pelvis.

Transverse, or bi-iliac diameter	5.$\frac{1}{8}$
Anterio-posterior, or sacro-pubian diameter	4.$\frac{5}{8}$
Oblique, or sacro-ilio-cotyloid diameter	5.$\frac{1}{8}$

Not only are these the most perfect dimensions which a female pelvis can have, but they are precisely in the proportion which the longest diameter bears to the shortest, in the Venus of the Florentine Gallery, according to CAMPER, namely, as 46 to 34; whereas in the Negro or Ethiopian race, the proportion is 39 to 27$\frac{1}{2}$, or what amounts to the same thing, the longest diameter of the pelvis of the Negro girl above-mentioned is only 3.$\frac{8}{10}$ inches, while the shortest is no more than 3.$\frac{6}{10}$ inches. In this respect my admeasurements agree with those given by SOEMMERRING.

What has just been observed of the skeleton generally, and of the pelvis in particular, applies with equal force to the form and dimensions of the head. So far from having any trait of Ethiopian character in it, this part of our mummy exhibits a formation in no way differing from the European.

On looking at Plate XXI. which represents with scrupulous accuracy the contour of the head of the natural



Henry Perry del.[t]

W. Basire Sculp.

size, it is impossible not to be struck with the likeness it bears to the skull of the Georgian female represented in the "*Decas tertia Craniorum*" of BLUMENBACH's very instructive collection. In both we have the facial angle approaching nearly to a right angle: and the configuration of the vertex and occiput in each is such, as must attract attention for its elegance, and the indication of a something more important than mere beauty.

It may be affirmed then, that CUVIER's opinion respecting the Caucasian origin of the Egyptians, founded on his examination of upwards of fifty heads of mummies, is corroborated by the preceding observations; and that the systems which were founded on the Negro form, are destroyed by almost all the recent, and certainly the most accurate investigations of this interesting subject. It is a curious fact, which has been noticed by more than one traveller, that whole families are to be found in Upper Egypt, in whom the general character of the head and face strongly resembles that of the best mummies discovered in the hypogei of Thebes; and not less so, the human figures represented in the ancient monuments of that country.

Having proceeded thus far in my inquiry into the state of preservation of the mummy before me, I determined, perfect, and beautiful as it was, to make it the object of further research by subjecting it to the anatomical knife, and thus to sacrifice a most complete specimen of the Egyptian art of embalming, in hopes of eliciting some new facts illustrative of so curious and interesting a subject; for it is to be observed, that the deficiency of our knowledge on the art of preparing mummies by the ancient Egyptians, both as to the mode of

operating, and of the degree of perfection to which that art was carried among them, has arisen from imperfect and inferior specimens having been generally employed for the purpose of investigation, the best and most perfect mummies (resembling the one I have undertaken to describe) having, invariably, been preserved intact, and, in most cases, uncovered, as valuable objects of curiosity, in private or public Museums. A rapid glance at what has been publicly recorded on this head, will prove the correctness of my assertion.

The Royal Society itself has contributed but little towards the knowledge of this interesting branch of the natural history of man. The subject of Egyptian mummies was brought before it, by two of its members, who from talent and professional avocations, were well calculated to do it justice, had their opportunities been more favourable. The first paper on this subject in the Transactions, is by Dr. HADLEY, who, in 1763, examined a mummy which he had received from the Royal Society, and an account of which he presented in the following year. The paper contains a very clear statement of the successive operations for ascertaining the real condition of the mummy, but seems not to have added much to what was already known, at that time, respecting the mode of preparation.

The mummy retained not the smallest vestige of the soft parts, except some of the tendons of the feet, to the sole of one of which a *bulbous* root, perhaps an onion, was discovered firmly bound by fillets and pitch; reminding us of JUVENAL'S lines:

> "O sanctas gentes, quibus hæc nascuntur in hortis
> "Numina!"

The bones were all more or less brittle, and some of them separated into splinters in the progress of the examination.

After an interval of thirty years, we find the subject of Egyptian mummies again before the Royal Society, in consequence of a letter from Professor BLUMENBACH, to Sir JOSEPH BANKS, being read at one of the meetings in 1794, giving an account of three small mummies, and a larger one, opened by the Professor when in London. The latter, as well as one of the former, belonged to the British Museum, and the curators had allowed him to select them from among those deposited in that national collection. In addition to these, BLUMENBACH re-examined the mummy of a child supposed to have been six years of age, which had been inspected before. The first of these proved to be nothing else than a mass of bandages, strongly impregnated with resinous substance, without the smallest vestige of a human body within them, affording another instance, in addition to those noticed by other writers on the subject, of the impositions practised either by the Egyptian embalmers, or by the modern traffickers in mummies. The second mummy opened by BLUMENBACH proved to be that of an ibis. In the third supposed mummy, only one or two fragments of a human body were discovered; while in the fourth, the largest, indeed the only real mummy, nothing but naked bones were found within the bandages, a result not far different from that which BLUMENBACH subsequently obtained from the examination of two other mummies belonging to private individuals, which he had an opportunity of opening before he quitted this country. Such is the sum total of the information to be found in the Transactions of the Royal Society on the subject of

Egyptian mummies, and the extent of its contributions towards the elucidation of this interesting topic, if we except the little that Dr. GREW has said in his printed catalogue of the Museum of the Society in 1681.

Nor had the inquiries of scientific men on the continent been more successful until lately. Thus KESTNER, who described the mummy at Leipzig; HERTZOG who opened the one at Gotha, in which more idols, beetles, frogs and nilometers were found than had ever been met with under similar circumstances; GRYPHIUS, who in the year 1662, gave an account of two mummies in the Dispensary of CRUSIUS at Breslau; and lastly BRÜNNIEL, who dissected the mummy at Copenhagen, found little more than fragments of bones, or whole skeletons in a dry and unsatisfactory state. BRÜCKMAN and STORR, the one at Cassel, the other at Stuttgard, are quoted by BLUMENBACH, as having written on the subject of mummies; but I have not had the means of procuring their descriptions, which, however, to judge from BLUMENBACH'S language, contain no better account of the state of those specimens of Egyptian art, than he himself had been able to give from his own experience.

Long before either Doctor HADLEY or BLUMENBACH had directed their attention to Egyptian mummies, ROUELLE, an eminent French chemist, and CAYLUS, an antiquarian, had treated the same subject with minute precision, although not with better results. Of two papers, which the former had promised, one only was published in the Mémoires of the French Academy of Sciences. In that paper, ROUELLE has given an account of several mummies he had examined, with a view to ascertain the mode in which they had been em-

balmed; and he has described several chemical operations to which he subjected them, in order to discover the nature of the ingredients employed by the Egyptian embalmers. The result of these experiments by no means settled the question they were intended to resolve. With regard to the anatomical state of the mummies examined by him, the information he has given us is very deficient. All he has said reduces itself to a repetition of the common adage "dry as a mummy." Like Dr. HADLEY, BLUMENBACH, and many subsequent writers, he came to the conclusion, that Egyptian mummies are invariably found in a state of aridity, without the least vestige of the soft parts or viscera, and are wholly deprived of humidity, in fact, that they are mere skeletons enveloped in "cerecloth." It will be seen, that such an opinion requires considerable modification.

The next information of importance we possess on the subject of Egyptian mummies, is to be found in the third and fourth volume of the Transactions of the Royal Society of Gottingen. Of two papers on the subject by Professor HEYNE contained in those volumes, the first relates to the antiquity of mummies generally; and the second gives a description of a mummy presented by the King of Denmark, to the Museum of the Royal Society of Gottingen, on which Professor GMELIN instituted various chemical experiments detailed in a separate paper, intended to throw some light on the art of embalming. Numerous as those experiments appear to have been, conducted, moreover, with great care and precision, they nevertheless lead not to more satisfactory conclusions, than the experiments of his predecessor ROUELLE, between whose results and GMELIN's there exists considerable

discrepancy. With respect to the state of integrity of the mummy itself, it is mentioned by Professor HEYNE, that not only had the viscera been removed, but that the muscles also, and every soft part, had been taken away by accurate dissection, made with some sharp instrument; for nothing was found to intervene between the dry substance of the bones and the bandages.

It is needless in this place to advert in a particular manner to the writings of older authors, who have more frequently indulged in conjectures than adhered to facts. They have treated the obscure, yet interesting subject of Egyptian mummies, with more erudition than discrimination, and have not removed the difficulties by which it is surrounded. Much curious information, however, may be collected from their works, especially from those of KIRCHER, PIETRO DELLA VALLE, GREENHILL, POCOCK, BREMOND, MALLET, Dr. MIDDLETON, and others.

The temporary occupation of Egypt by the French army offered a wide field of observation to the antiquarians and the men of science of that nation, the fruits of whose labours have been inserted in a splendid work which must be familiar to the Fellows of this Society. Among the many objects of research to be found in that work, it appears that that of mummies engaged the attention of several very competent individuals, such as DENON, JOMARD, LARREY and ROYER. These gentlemen directed their inquiries to the number of those preparations to be found in the many excavations they visited, to their state of preservation, and to the probable method by which they had been embalmed. The number of mummies discovered by them was prodigious,

and although they state, that the degree of preservation in which the mummies were found varied considerably, they all agree, more or less, in asserting that, as far as they had examined them, there appeared little more than the skeletons remaining. JOMARD, indeed, mentions generally, that on removing the bandages, " on observe un corps noir et difforme," and all of them are equally silent on the fact or possibility of the viscera being still in existence in any mummy. ROYER, who has taken a more extended view of the subject, and has described with great accuracy, the appearances in two or three distinct classes of mummies, does not mention any of the facts in reference to them, such as I shall presently relate in connection with my own mummy. This omission induces me to believe that the French naturalists never met with a perfect mummy, and that, therefore, the description of a mummy in every respect much better preserved than any that has hitherto been noticed, must be a desirable object to the antiquarian, the learned commentators on ancient historians, and to men of science in general. Baron LARREY's Memoirs are chiefly intended to determine the question of the identity of the present race of Copts with the aboriginal Egyptians, whose descent he traces from the Abyssinians and Ethiopians by a comparative examination of the crania of several mummies he had collected in the desert of Saqquarah, and of those of the modern Copts found in a cemetery near Alexandria. The mummies of Saqquarah, however, are acknowledged to be very inferior to those of Upper Egypt by all travellers; and cannot, therefore, be put in competition with the latter, in an inquiry into the art of embalming among the ancient Egyptians.

must be attributed to its having been stained with some gum. The brain had been removed through one of the orbits, into which false eye-balls had been introduced. The eye-lids were entirely removed, probably from accident. Indications of muscles were observed on the abdomen, the scapulæ, the back, and on the nates. The legs were not uncovered; but the toes were all exposed. The arms were placed so that the hands came upon each groin, there being a middle space at the pudendum, of about two inches, between them. The male organs were so enveloped as not to be traced in any degree whatever. Sir EVERARD took notice of the principal dimensions of this mummy, which, as affording the means of comparison between the two sexes, may properly find a place here after those of my female mummy.

	Feet.	Inches.
Length of the body, from the vertex of the head to the bottom of the heel - -	5	2
Breadth across the shoulders -	1	3
Length of the arms, from the top of the shoulder to the end of the fingers -	2	6
Breadth from trochanter to trochanter	1	0
Length of the foot - - - -	0	9

To those who are familiar with the accounts published by recent travellers in Egypt, it will be needless to repeat that Dr. BRADLEY on the one hand, and Dr. RICHARDSON on the other, acknowledge that the mummies which they had an opportunity of examining appeared to consist of little more than mere dry bones.

My friend, Mr. WALTER DAVIDSON, of the house of HERRIES and FARQUHAR, has also added to my store of

information on the present subject. He purchased a mummy from the excavations near Thebes, at Gournon, in February, 1820, selected out of a dozen which he opened, as the best preserved. It proved to be that of a male. It was quite dry; the hair and teeth were most perfect, the former being very long, in great profusion, and smoothly combed down. The body contained only a large quantity of gum, and there was no flesh, or very little of it, on the bones. Every part was brittle. It was enveloped in cotton bandages to a great extent, and was contained within two cases. His fellow traveller, T. Coates, Esquire, of Newcastle, brought from Egypt another mummy, which was presented to the Literary Society of that town, and of which an account appeared in some of the public papers of last year. This mummy was not opened. Within the last few months a highly preserved mummy, and one which, to judge from the description given in the public papers, I should be inclined to class with [my own, has been dissected and exhibited before the Literary Society of Bristol. We are promised a detailed account of the appearances by a competent person; and if these should correspond with what is detailed in this paper, an additional value will be given to my observations, which I could scarcely have hoped they would so soon receive.

The facility which I deemed it my duty to afford to every individual interested in science, of witnessing the demonstrations of my mummy, brought to my house, among others, Mr. Wilmot Horton, Under Secretary of State for the Colonial Department. Pleased with what he there saw, this gentleman was kind enough to place at my disposal, the head and right arm of a male mummy, which, though not

so curious in point of preservation compared to other specimens, are objects of no inconsiderable interest, from the locality in which they are said to have been discovered, namely, near Tripoli, on the coast of Africa. They were forwarded by the British Consul resident in that town; but as no circumstance connected with the discovery is known, it would, perhaps, be premature to come to any conclusion as to the probability of the art of preparing mummies having been exercised among the inhabitants of the north of Africa, as it had been by those of the east.

These remains of a mummy are not altogether devoid of interest, in as much as they supply us with corroborative proofs of the general principles of the art of embalming, having been such as I shall describe in this paper; and as affording additional evidence of its strong power of preservation.

The head, in this case, was covered with a few bandages of coarse linen closely adhering, and, indeed, intimately connected with the integuments and muscles of the face, by a black resinous substance, which must have been applied hot, as it has burnt the soft parts to the very bone, and even some of the teeth. The hair is preserved, but it is with great difficulty that it can be disentangled from the hard and brittle resin. It is about two inches long, of a reddish brown, and in slight curls and tufts. Hair grew down the cheeks and on the chin, about an inch in length. I removed the bandage, and thus denuded the head and face altogether in most parts, carrying away, necessarily, the integuments and muscles. The head is not prepared in the best manner, but according to one of the least expensive processes. The brain was

removed through the nostrils, and in the operation the os unguis of the right side was injured. The eyes were preserved, but in taking away the bandages they came away with them. By immersion in hot water, I was enabled to separate the external coat of the eye ball, which became as soft and globular as in a recent specimen, though discoloured. There is a very remarkable feature in the skull, and that is the extreme depth of the orbits, which amounts to 2½ inches, tapering inwardly, so as to present the appearance of a perfect cone.

Whether this head bears marks of being that of an African, in the full sense of the word, or not, I am not able to decide. The contour of the head, the maxillary bones and jaws, and the appearance of the hair, incline me to that opinion; but the Members of the Society will have an opportunity of judging for themselves, by inspecting the head after the meeting. Certain am I, that it is not the head of a Negro.

The arm, sent with the head from Tripoli, is uncovered. The muscles are preserved, but they are harder than in my other perfect mummy. The hand is stretched. There is only a portion of the humerus, which seems to have been fractured off, not cut regularly, from the appearance of its splintery extremity. The length of what remains is 8 inches. That of the fore arm is 11¼ inches, and the hand, from the wrist to the tip of the middle finger, is 7½ inches long. This specimen also will be submitted to the inspection of the Members after the meeting.

Having thus brought within narrow limits the literary history of Egyptian mummies in general, I shall proceed to

the conclusion of my account of the dissection of the one I have described, by which I trust the Society will be enabled to form an opinion of the degree of importance that belongs to the present communication.

An incision having been made into the parietes of the abdomen, just below the ribs, and continued down to the hip bone, on both sides, and carried along the margin of the pubis, the whole of the integuments and muscles were removed, so as to expose that cavity completely to view. The objects which then presented themselves were a portion of the stomach adhering to the diaphragm, the spleen much reduced in size and flattened, attached to the super-renal capsule of the left kidney, and the left kidney itself, imbedded in, but not adhering to the latter, and retaining its ureter, which descended into the bladder. This, as well as the uterus and its appendages, were observed in situ, exhibiting strong marks of having been in a diseased state for some time previously to the death of the individual. Fragments only of the intestinal tube could be found, some of them of considerable dimensions, and among them part of the cœcum, with its vermiform appendix, and portions of the ilium. Several large pieces of the peritoneal membrane were likewise observed. (See Plate XXII. fig. 1, 2, 3.)

There were also several lumps of a particular species of brittle resin, two or three small pieces of myrrh in their simplest and natural state, and a few larger lumps, of an irregular shape, of some compound of a bituminous and resinous nature, mixed up with an argillaceous earth. These seemed to have been forced up to fill the cavity of the abdomen, after the removal of the largest portions of the intestines, and of

Fig. 1.



Fig. 2.

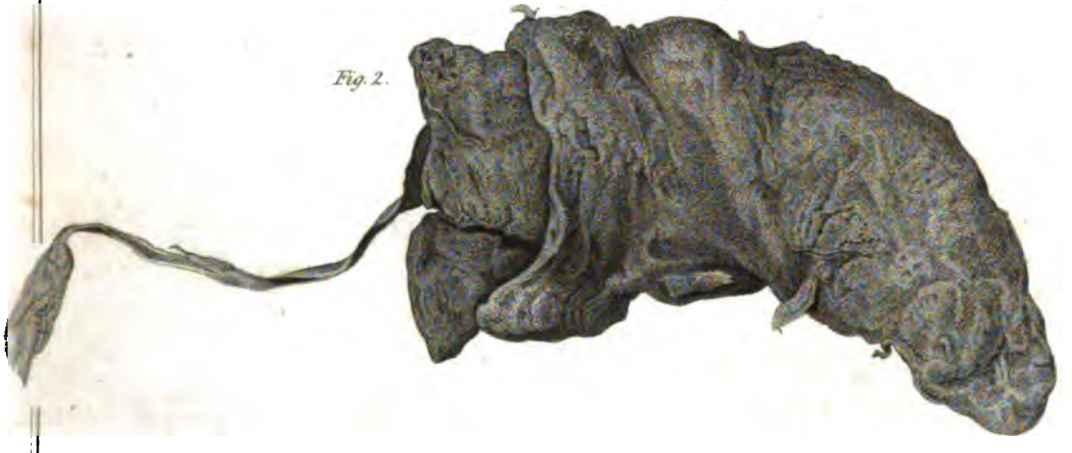
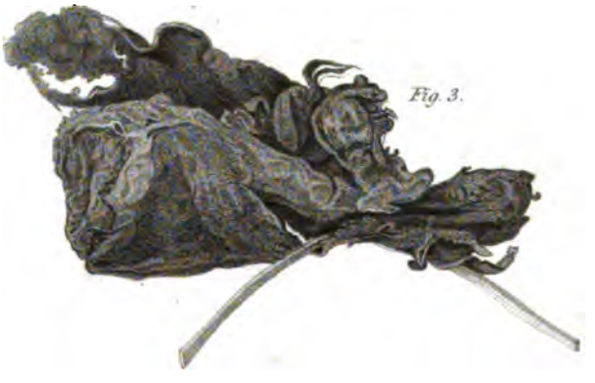


Fig. 3.



Henry Perry del.t

W. Nasire sculp.t

as much more of the contents of that cavity as the embalmers could get at, by the very clumsy process which appears to have been employed in this case, for the extraction of those parts through the anus. This orifice was cut in various directions, probably with the intention of enlarging it; but, more likely, in consequence of the forcible introduction of the instrument employed in extracting some of the viscera. No traces of the right kidney could be found, nor of the liver or minor glands of the abdomen; although, among the many fragments of membranes and other soft parts which lay in confusion, and were removed for better inspection, the late Dr. BAILLIE, who was present at one of the demonstrations, detected the gall-bladder slightly lacerated, but in other respects perfect, retaining a small portion of the peritoneal covering of the liver attached to it, as well as considerable remains of its own ducts.

The cavity of the abdomen being emptied of all its contents, I continued the circular incision back to the spine, which I divided at the first lumbar vertebra. I next sawed off the thighs a few inches from the hip, and dissected carefully all the soft parts from the pelvis, so as to ascertain the condition and dimensions of this important part of the female skeleton. In performing this last operation, which occupied me two hours a day for nearly a week, (some medical or scientific friends being present at each sitting), we could not help being struck with the remarkable degree of preservation of the muscles, such as had never before been noticed in Egyptian mummies, and such as to admit of their being separated from one another, as readily as in the dissection of a recent subject. Nor was the perfect condition of the articulatory

membranes and ligaments less surprising, which allowed us to impart to the great articulation of the thigh with the ilium, its various movements, a circumstance seldom observed, even in modern preparations of the pelvis.

Some of the dissected muscles, as well as the denuded pelvis itself, will be submitted to the inspection of the Fellows after the Meeting of the Society.*

The cavity of the thorax was next examined, and this I effected without disturbing the anterior portions of the ribs or breast bone, by simply detaching the diaphragm all round, and bringing it away. It was found that the pericardium, which adhered partially to the diaphragm, came away with it, and that a laceration had taken place at the same time in that sac.

This circumstance denoting that the heart was present, I introduced my hand to remove it, when it was found suspended, *in situ*, by its large blood vessels, in a very contracted state, attached to the lungs by its natural connections with them. The latter organs adhered throughout their posterior surface to the ribs, and were brought away altogether in as perfect a state as could be effected.

All these various parts are accurately represented in Plate XXIII. fig. 1, 2.†

The last cavity examined was that of the cranium; for this purpose it was sawed in two, horizontally, and when

* Among the detached muscles exhibited in the most distinct manner, there were the triceps femoris, the sartorius, portion of the vastus externus, and the principal abdominal muscles.

† All the parts represented in Plate XXII. and XXIII, were exhibited after the meeting, to the Fellows and Visitors present, on three successive Thursdays.

Fig. 1.

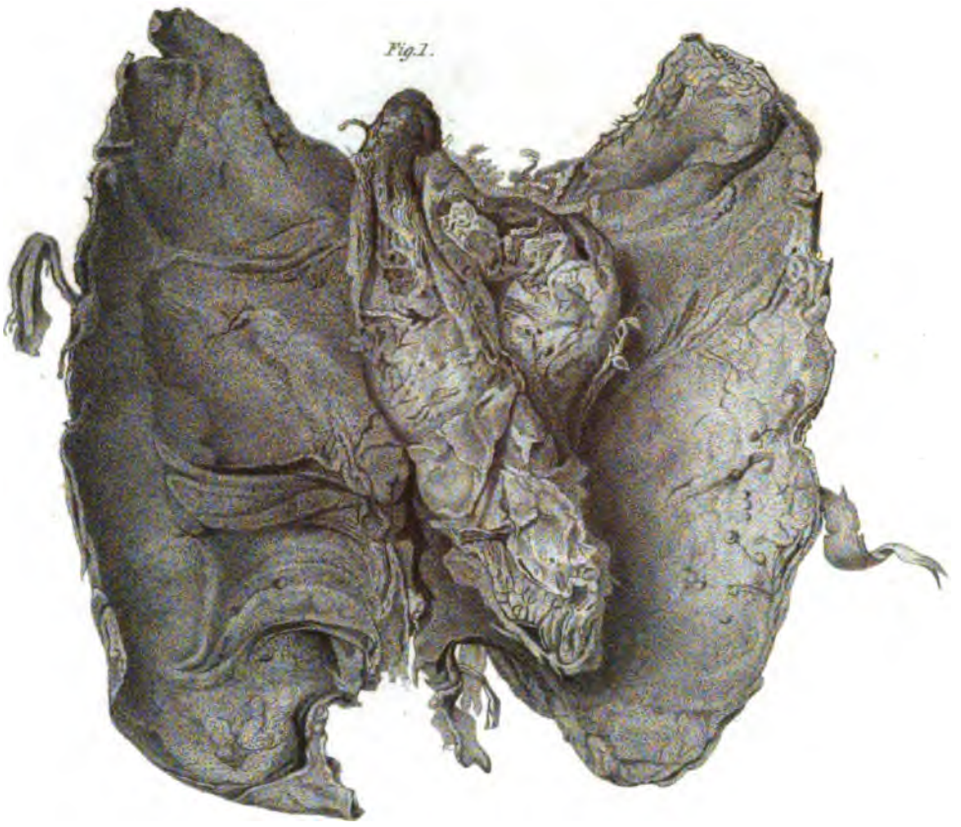


Fig. 2.



Henry Perry del.

W. Basire sculp.

thus opened, it was ascertained that the brain had been removed through the nostrils; the plates of the inner nasal bones having been destroyed in the operation by the instrument employed, as evidenced by the state of those parts. It is a matter of no little surprise how, under circumstances of so much difficulty, the operators could have contrived to remove every vestige of the membranes investing the brain, one of which is known to adhere firmly in most subjects to the inner surface of the superior cranial bones. There can scarcely be a doubt but that some injection had been thrown into the cavity in question, to clear it out in so perfect a manner; for no instrument could have effected such a purpose. A black resinous substance, but in a small quantity, was found adhering to the inner surface of the occipital bone, which must have been thrown in quite hot, as it had penetrated through, and burnt partially, the superior part of the lambdoidal suture through which the liquid escaped, so as to be now seen extravasated under the scalp. But how this liquid resin was thrown in, and for what purpose, it is not easy to conjecture. It could only have been made to penetrate through the opening which had previously been made in the ethmoid bone, to extract the brain; and if so, it is difficult to conceive in what manner it was made to reach the spot it now occupies without having adhered to any other intermediate portion of the cranium. It was remarked, at the time of opening the head, that its inner surface was studded with small crystals of what appeared to be an animal substance, resembling *steatine*.

The last observation I have to make on the structural condition of this mummy, refers to the state of the eyes,

which appear not to have been disturbed; and to the state of the mouth, which was as carefully examined as circumstances would admit, without destroying the contour and general appearance of the face. The tongue is preserved, and neither above nor below it was there found any coin or piece of metal, as recorded of some of the mummies, but a lump of rags dipped in pitch. The teeth, as I before remarked, are perfectly white and intact; nor did I observe that peculiar cylindrical form of the incisores which has been assumed by some naturalists, as one of the characters of the head in the Ethiopian race.

In order to complete the present essay on Egyptian mummies, I must now trouble the Society with the farther details of my observations on the age of the female under our consideration, and on the disease of which I conceive her to have died, as deduced from the examination of the parts. When we reflect for a moment, that the individual in question, according to the more generally received opinion respecting the antiquity of mummies found in the hypogei of Thebes, had probably lived upwards of three thousand years ago,* it will bespeak a very extraordinary power of preservation in the mode of embalming then practised, in some cases at least, to be able to say, that the female of which we are speaking, died at an age between fifty and fifty-five years; that she had borne children; and that the disease which appears to have destroyed her was ovarian dropsy attended with structural derangement of the uterine system generally.

* Consult Mons. JOMARD's Memoir on the antiquity of the hypogei at Thebes, Mons. ROYER on the art of embalming, and the recent publications of Monsieur CHAMPOLLION.

That such are the facts, I appeal to the state of the bones of the ilium, and of the uterus with its appendages, for proof.

The first exhibit that peculiar degree of thinning in the centre of their osseous plates which has been noticed in women by Professor CHAUSSIER and others, in the course of a great number of observations, as an indication of their having borne children, and of their having passed the fortieth year. This thinning of the bones, in the particular part just mentioned, has never been observed under forty years of age, and becomes gradually greater until fifty-five, when it has reached its maximum, however longer the woman may continue to live. In my mummy it will be seen, on looking at the pelvis, or at Plate XX. that the thinning of the iliac bones seems to have reached its maximum; and as there are no characters of decrepitude in the individual, it appears to me, that from fifty to fifty-five was about the number of years the individual had lived. The thinning of the bones in question has not been observed in women who have not borne children, nor am I aware that it has been noticed in the male sex, except in the shoulder blades of porters, long used to carry heavy weights on their back. In confirmation of this I have to state, that in more than one pelvis in my collection, with the history of which I am perfectly acquainted, I find the above law to hold good. The thinning of the central portions of the ilium in this mummy is so complete, that small fragments have come away in consequence of their being frequently touched by the numerous persons who saw the pelvis at my house, and were incredulous as to its real texture without touching it.

With regard to the disease, the effects of which I detected,

I have to state, in support of my assertion, that the womb is of larger dimensions than it is known to have at the age in question: that the ovarium and broad ligament of the right side are enveloped in a mass of diseased structure, while the Fallopian tube of the same side is perfectly sound and beautifully preserved; and lastly, that the contracted parietes of what (to judge from the dimensions of the remains) must have been a large sac connected with the left ovarium, leave no room to doubt of the correctness of the opinion I have ventured to express. This opinion, I have the satisfaction to add, has not been disputed by a single individual out of the many very competent judges to whom I submitted the parts, among whom I may mention the late Dr. BAILLIE, and Mr. WILSON, Mr. CARPUE, Mr. BROOKS, and others. The whole of the uterine system, as now described, forming the most ancient pathological preparation of its kind, is now in my possession, and will be exhibited to the Members after the meeting, and may be compared with its accurate delineation as given in Plate XXII. fig. 1.*

* Another mark, denoting the previous existence of disease, I detected on the scalp, namely, the remains of that peculiar cutaneous affection of the head, which has been denominated *Porrigo decalvans*, from its effect of destroying the hair as well as of preventing its growth. Was it for this, that the head of this mummy had been shaved, as I have already stated, so as to admit a readier application of remedies to the morbid part, as practised at the present day? or was it for any other particular reason? No mention is made, in any author, of females having their head shaved, though the cutting off of the hair in men is frequently alluded to. Again, with what sort of instrument has the operation been executed? It certainly could not have been performed with scissors, however skilfully constructed, as the hair could not have been cut so close, nor of such uniform length with them. If with any instrument approaching to our razors in structure, of what material was it made? These are highly curious inquiries, which naturally spring from the examination of the condition of this mummy.

The next points of inquiry to which I directed my attention were, First, to discover, if possible, the method by which this perfect specimen of Egyptian mummies had been preserved. Secondly, to ascertain how far the description given by ancient writers of the art of embalming among the Egyptians, applied to the present specimen. And lastly, to determine the nature of the substances employed for the purpose.

In pursuing this investigation, I flattered myself that the Royal Society would consider it as something more than a mere object of useless curiosity.

In order to carry on my inquiry respecting the three points above-mentioned with that precision which alone could lead to a satisfactory conclusion, I proceeded to note down all the principal facts resulting from a close examination of the mummy, as detailed in this paper; next to ask myself how those facts could be explained; and lastly, if explained, whether the facts themselves could be reproduced by following the method which the explanation might point out. I shall leave it to the Society to determine, whether I have been successful in my attempt.

The *first* fact to be noticed, in regard to the preparation of the mummy, is the chestnut brown tint of all the bandages, denoting the presence of some colouring matter in them, the nature of which it was important to ascertain, in order to judge of the intention of those who employed it. For this purpose I made a few experiments with portions of the bandages taken from different parts of the body, when it was found that they had all been steeped in some vegetable solution, which, when treated with gelatine, exhibited the presence of tannin in considerable quantity, a circumstance far-

ther corroborated by the peculiar taste of the infusion. Now, as every particle of the bandages had been equally died with this vegetable solution; and as it appears evident, from other circumstances, that such a process had not been adopted for the sake of giving to the envelopes of the mummy the particular colour in question, may we not infer that the Egyptian embalmers were acquainted with the antiseptic power of astringent and slightly bitter vegetable infusions, a power which modern discoveries have attributed to the presence of the peculiar principle already mentioned?

This inference is confirmed by the *second* fact to be noticed, namely, the appearance and condition of the integuments, which, besides being of a dark brown colour, differ in no respect from prepared leather, particularly those of the abdomen, the thighs, and the mammæ. The Society will have an opportunity of examining several portions of these integuments, and will be struck with the similarity alluded to. Indeed they might be taken for prepared leather at first sight, and the knowledge which I obtained, by a second series of experiments, that a solution of some vegetable astringent, similar to that used for the bandages, but much stronger, had been employed to produce that appearance, must prove conclusive on this point. A question then will naturally arise, was it the bark of the acacia, so plentiful in Egypt, that was employed for the purpose; or did the Egyptians import oak bark from the coast of Syria, where that tree grows in abundance *

* It is not improbable, that a gum, not unlike kino, may have been the substance used for the purpose of tanning the integuments, as I found, among the various lumps of resin contained in the abdomen, several portions of such a substance,

The two preliminary and curious facts just detailed, connected with the art of embalming among the Egyptians, have never been noticed before. Neither HERODOTUS, nor DIODORUS SICULUS, mention them, and all the more modern writers are silent on the subject.

The *next* fact worthy of notice, is the appearance of minute saline crystals, found in great abundance in almost every part of the external, but more particularly of the internal surface of the body. These, at first, had escaped notice; but upon the various portions of the dissected mummy being exposed to the open air, in one of the rooms on the ground floor in my house for some weeks, where a fire was kept, the appearance of the saline particles became strikingly visible. This saline efflorescence I gently swept off the surface with a new brush, and subjected to various analytical experiments, from which it results, that it consists of nitrate of potash, carbonate, sulphate, and muriate of soda, and traces of lime. Now, as as none of these salts have ever been observed to form spontaneously, either within or upon the surface of preserved human bodies, particularly where the contact of external air has been so studiously excluded as in the present case, it follows, that in the preparation of mummies, the embalmers must have had recourse to the immersion of the body into a saline solution of a mixed kind. HERODOTUS, indeed, states that the body was covered with natron for the space of seventy days; but it is more probable, that the water of the celebrated natron lakes, which lay so conveniently at hand, rendered more active by previous evapo-

specimens of which I exhibited to the Society, and which gave to distilled water a deep brown colour, from which a precipitate is obtained by gelatine.

ration, was used for the purpose. The presence of lime may be accounted for by supposing, that in a preliminary operation, the cuticle, which, as I before stated, could not be detected in any part of the body, except the head and the extremity of the toes, and has been found invariably wanting in all other mummies, was removed by means of that alkaline substance. This circumstance again goes far to show that the Egyptian embalmers were acquainted with an important physiological truth, namely, that in order to promote the absorption of liquid substances, particularly of the tanning liquor and saline solution, applied to the external surface of the body, the cuticle must first be removed.

The presence of saline substances in mummies has been noticed by more than one modern writer, especially by Mons. ROYER, already mentioned in the course of this essay; but the conjecture as to the origin of the salts themselves, has not been hinted at before.

A *fourth* fact, deserving of our attention, is the presence of a resino-bituminous substance between some of the folds of the remaining portions of the peritoneal membrane. On collecting this substance, and instituting some experiments upon it, I ascertained that the bitumen was mixed with a greater proportion of wax, so as to have rendered the mixture perfectly plastic. To have penetrated thus far, and to have lodged between closely adhering membraneous folds, this mixture must either have been injected quite warm into the cavity of the abdomen, or the body itself must have been plunged into a vessel containing a liquefied mixture of wax and bitumen, and there kept for some hours or days, over a gentle fire. The latter operation, not noticed by the older historians, has

indeed been surmised by some of the modern writers on the subject; but in none of them have I been able to find a corroborating proof of the correctness of such a surmise. The examination of my mummy has afforded me that proof, in the shape of a *fifth fact*, namely, the thoroughly impregnated state of the bones, membranes, and muscles, in every part of the body, by the same waxy and bituminous substance. The inspection of the bones of the pelvis, of those of the thighs, and of the vertebræ, as well as of some of the muscles, and membranes, to be submitted to the Society, will shew this abundantly. Now such a condition of the parts could not have been produced, but by maceration or immersion, for a length of time, of the whole body, into a liquefied mixture of those two ingredients; accordingly we must conclude that such a process was actually followed by the embalmers; unless we feel disposed to believe that they injected the body through the blood-vessels; an operation of which there is not the most distant evidence in the mummy before us.

The adoption of my view on this point, is farther authorized by the soft and pliant condition of the capsular membranes, of the cellular texture, and above all, of the two coverings of the spinal marrow, than which nothing can be more beautiful or striking; whether we admire their perfect preservation, or reflect on the number of centuries through which these delicate tissues have travelled. I have already noticed to the Society the flexibility of the joints, a circumstance which is entirely due to the process here explained; and now I have to add that this process is made out beyond contradiction, by my having been able to separate the wax by means of

combustion and ebullition, from the soft parts, particularly the muscles, the singularly distinct fibres of which, beautifully arranged and displayed, the Society will not omit remarking.

In examining the dissected parts of the mummy, which I have carefully displayed for public inspection after the meeting, the Members will not fail being struck with the difference that exists between the two *nates* detached from the body. The one has been left in the state in which it was handed down to us by the Egyptian embalmers, dark, tanned, contracted, and impregnated with the mummifying ingredients; the other, on the contrary, has been deprived, in toto, by my process, of those ingredients, (the principal of which is bees wax, as will be seen from the quantity which I collected); so as to appear like the same part in a recent subject, soft, elastic, of a yellowish white, with the cutaneous pores very distinct, and with its muscles, adipose substance, and blood vessels perfectly striking.

The *sixth*, and last fact to be noticed, is the presence of several moderately sized lumps of an earthy matter, mixed with pieces of resin, found loose in the cavity of the abdomen. That these were thrown into that cavity for the double purpose of filling up the space left in it by the abstraction of some of the viscera, and of adding, at the same time, to the antiseptic power of the process employed in embalming, are conjectures that will perhaps be readily admitted. The experiments made to ascertain the nature of the earthy substance in question, tend to prove the latter part of these conjectural propositions. It was found to consist of the same saline compounds, noticed on the surface of the mummy, mixed with

argillaceous earth. Now, if the embalmers used the water from the natron lakes, as I have laid down good grounds for believing, nothing is more probable, than that they also made use of the earthy sediment of that water which contains the salt in question, and which could be procured in abundance at the margin of those lakes, where it has been observed by the naturalists who accompanied the French expedition into Egypt.

As to the nature of the resin and bitumen used as ingredients in the embalming process, it is a question of comparatively little interest. Nor does it matter much, whether aromatic vegetable substances were employed or not. In the mummy before us, two or three small pieces of myrrh in a loose state were found, and evidence is not wanting of both resin and bitumen, though not in their purest form, having been had recourse to. But their presence seems by no means necessary for the completion of that admirable method of embalming, devised and followed by the ancient Egyptians, which my inquiries have been directed to ascertain, and which may be summed up in a few words by saying: that it consisted in impregnating the body with bees wax.

The various circumstances detailed in this essay furnish us with sufficient reasons for believing, that in the most perfect, and, I would call them, the *primitive* specimens of the art of embalming, the progressive stages of the Egyptian method must have been as follows:

A. Immediately after death the body was committed to the care of the embalmers, when, in the majority of cases, the viscera of the abdomen, either wholly, or partially, were forthwith removed; in some cases through an incision on the one

side of the abdomen, as stated by HERODOTUS, and as proved by some of the mummies examined; and in others through the anus, in which latter case, the extremity of the rectum was previously disengaged from its attachments all round by the knife, and the intestines imperfectly extracted. The cavity of the thorax in the most perfect specimens was not disturbed.

B. The head was emptied, in all instances, of its contents, either through the nostrils, by breaking through the superior nasal bones, as in the instance under our consideration, as well as in that of the head from Tripoli, already mentioned, or through one of the orbits, the eyes being previously taken out, and artificial ones substituted in their place, after the operation, as in the instances of the mummies examined by Sir E. HOME and Mr. BRODIE. The cavity of the cranium was repeatedly washed out by injections with some fluid, which had the power of not only bringing away every vestige of the substance of the brain, but even of the enveloping membranes of it. Yet the liquid could not have been of a corrosive nature, else the tentorium, or that membranous floor which supports the brain must have disappeared with the meninges; whereas it is still in existence, and does not appear to have been in the least injured. A small quantity of hot liquid rosin was then injected into the cranium.

C. The next step taken in the embalming process, was to cover the body with quick lime for a few hours, and after to rub the surface of it with a blunt knife, or some such instrument as would most effectually assist in removing the cuticle. The scalp, however, does not appear to have been touched; and care was taken also not to expose the root of the nails

to the action of the alkali, as it was intended that these should remain in all cases. In the mummy I have described, this point has been so much attended to by the embalmers, that the nail of the principal toe of the right foot having been detached, it was replaced and retained in its position by three or four turns of thread passed around it; and in this state it must have continued for the last thirty centuries.

D. The operation of removing the cuticle being accomplished, the body was immersed into a capacious vessel, containing a liquefied mixture of wax and resin, the former predominating; and some sort of bituminous substance being added, not however essential to the process. In this situation the body was suffered to remain a certain number of days over a gentle fire, with the avowed intention of allowing the liquefied mixture to penetrate the innermost and minutest structure; nor can there exist any doubt, but that on this part of the embalming process depended not only its great preservative power, but also its various degrees of perfection. Thus, when the process was properly managed and watched, mummies, such as the one under consideration, would be produced; whereas when neglected or slovenly conducted, the mummy resulting from it, would present those appearances of dryness, blackness, and brittleness, together with the carbonification of the muscles and intimate adherence of the integuments to the bones, which have been noticed by Dr. HADLEY, Professor GMELIN, BLUMENBACH, HUNTER, Dr. BAILLIE, Mr. BRODIE, JOMARD and others, when they examined imperfect or inferior mummies. The fraudulent subtraction of the allotted quantity of wax required for the principal and important part of the embalming process we are now con-

sidering, or the neglecting to regulate the fire in using the wax and bitumen, would necessarily give rise to the latter results, which the covering bandages were sure to hide from the eye of the surviving relatives to whom the body was to be returned. It is also fair to presume, that inability or unwillingness on the part of friends and relatives to pay for the ingredients or for the labour necessary to carry on the operations just described, have, on many occasions, been the cause of mummies being prepared in that imperfect manner which has been noticed in so many instances.

E. When the body was taken out of the warm liquid mixture, every part of it must have been in a very soft and supple condition, wholly unsusceptible of putrefaction. The next steps therefore to be taken, with a view to convert it into a perfect mummy, must have been those, which, had they been taken before that part of the process that has been just described, would have exposed the body to inevitable putrefaction, in a climate like that of Egypt. I allude to the tanning of the integuments, and the exposing of their surface to the additional influence of those salts, the presence of which, as well as that of tannin, I have most clearly demonstrated.

Whether an infusion of the vegetable astringent employed for tanning the integuments was had recourse to in the first instance, and the immersion of the body into the concentrated water of the natron lakes followed, or whether the tanning liquid was itself made by infusing the vegetable astringents themselves in the water of the natron lakes, and the body then immersed into it, are questions, which it is neither possible, nor important to decide; the body was unquestion-

ably submitted to the operation of both those means, but in what order, it is difficult to ascertain; and when the embalmers judged by the condition of the integuments, that they were sufficiently impregnated with the active principles employed, the body was allowed to dry for a few hours, and then the bandages previously prepared with a solution of *tannin* also, as proved by my experiments, were applied to the different parts, beginning with each separate limb.

While the operation of bandaging took place, the mummy must have been in a very supple state, else the numerous deep longitudinal wrinkles observed in all those parts where the integuments are generally looser, as in the upper part of the thighs and arms, as well as over the abdomen, and at the breasts, could not have existed. These wrinkles, so well marked in Plate XIX. must have been produced by the bandages at the time of their application.

It appears also, that with a view of rendering the bandages more supple in particular places, where such a condition was required, and of obviating the inconvenience of slackness in some of the turns, they were daubed over in a few places with two different substances, the one consisting of wax and resin, the other of resin alone, both applied warm; so that, while the first served to give pliancy to some of the linen employed, the second caused the slack and loose edges of the bandages to adhere together, by which process the whole was rendered compact and firm, without producing hardness.

The lumps of myrrh, resin, and bituminous earth, noticed in the abdomen, were pushed up through the enlarged aperture of the anus, immediately before the application of the bandages, for the purposes already detailed.

The preceding explanatory description of what appears, from the unquestionable facts collected in the course of my inquiry, to have been the best, and, in my opinion, the primitive mode of preparing mummies by the ancient Egyptians, differs from that found in HERODOTUS, as well as from those accounts which we read in other writers who came after him. It does not however appear that the eminent historian just mentioned had ever been present at the embalming of a mummy, or that he ever had an opportunity of examining one of them. He must, therefore, like many other travellers, have noted down what he had collected from hearsay, in which, amidst much that was surmised, there was something approaching to the truth. It is in evidence that the art was kept a profound mystery among those who professed it, so that the different modes of embalming described with such orderly minuteness of details by HERODOTUS, could only have been conjectural. It is a curious fact, that, with the exception of the lateral incision, and immersion into a saline solution mentioned by that historian, we find no confirmatory evidence of the other steps of the supposed processes of embalming detailed by him in any of the various mummies that have hitherto been examined. And in the one now submitted to the inspection of the Society, by far the most perfect that has yet been publicly described, we have none of the characteristic features of the three several modes of embalming which we are told were followed by the ancient Egyptians; while, on the other hand, some of the lesser features of each process are strikingly apparent. We have, in fact, the presence of that which HERODOTUS asserted was invariably removed in the better

prepared mummies, and some of those parts are absent, on the other hand, which he stated never to have been touched in the inferior class of those singular preparations. These facts will be duly valued by the scholar, and the commentators of that historian; and the explanation now given of the real mode of mummifying, will enable the lexicographer to advance with confidence, that the name *mummy* was given to such preparations from the circumstance of *wax* (*mum* in the Cophtic language), being the really preservative ingredient employed in their preparation.

I have had occasion in the course of this paper to observe, that as by carefully taking into consideration the various facts which presented themselves during the examination of our mummy, it was natural to suppose, that the mode in which it had been prepared would be discovered; so would that discovery be confirmed if, by acting on those facts, something resembling a mummy could be produced; and in the specimens which will be submitted to the members after the meeting, the different steps will be seen, by which I was led to what may be considered as an imitation of the Egyptian mummies.*

* There were exhibited after the meeting four different specimens of imitative mummies, each of them illustrative of one or two of the successive stages of the process of embalming detailed in this essay; the last being intended to illustrate all the stages together, and exhibiting a close resemblance to the Egyptian mummy itself. A still born child had been employed for the purpose, and this modern mummy has now been in existence upwards of three years, without bandage or covering of any kind, exposed to all sorts of temperature and rough usage without betraying the slightest vestige of decay or putrefaction. It is rather darker than the Egyptian mummy from the circumstance of a too concentrated solution of tannin having been employed in preparing it.

I purposely omit speaking of the various modes of embalming adopted by different nations, or of those which may have prevailed at different epochs in Egypt; although in the course of my investigation I collected ample materials for entering into such a subject. The art of embalming, with a view to the preservation of the human body, for an indefinite series of years, as strictly illustrated by the mummies of ancient Egypt, does not appear to have been practised with success by any other nation. We find no remains of such high antiquity in any other part of the world; and the mummies of Mexico, those of the Atlantic islanders, the dried bodies found in the catacombs of some of the states bordering on the Mediterranean, are but of yesterday, compared to the age of the mummy which I have had the honour of bringing under the notice of the Society. Indeed the art soon began to decline among the Egyptians themselves, and the mummies found in the hypogei which bear evidence of having been more recently erected, as well as those of the plain of Saqquarah, are, in every respect, inferior to the *primitive* mummies. Whether this arose from the growing ignorance of the real process, the directions respecting which could only have been handed down traditionally; or from carelessness in the operation; or from indifference on the part of the people toward such an object; or from all these causes united, it is not easy now to determine. Certain it is, that the genuine process of embalming, among the Egyptians under the dynasty of the Pharaohs described in this paper, appears to have been progressively disregarded, and forgotten among them, until at last it was lost altogether. Nor does it appear ever to have been known by other nations.

In order to appreciate properly the durability of the bodies prepared by the Egyptian process, it is essential to observe, that the mummy I have described with so much minuteness, after having resisted putrefaction for above three thousand years, covered by bandages, inclosed in a thick wooden case, and placed in recesses, far from the external influence of atmospheric vicissitudes, has since withstood the inclemency and variations of an English climate, without any of those protecting circumstances; nay, exposed purposely, but ineffectually, for four years, to the various causes that are known to favour putrefaction.*

The deep feelings of interest that have of late been excited respecting the Egyptians, have induced me to extend my present inquiry to a greater length, than I should have done under less inviting circumstances. It was impossible not to feel extremely interested in the subject; and when I beheld before me the heart of an Egyptian female, whom imagination, aided by historical records, may fancy to have been cotemporary with the great SESOSTRIS, I could not help experiencing a degree of enthusiasm, a portion of which, methought, I could impart to others.

I recollect with pleasure the sensation which the demon-

* A singular contrast this, with what has since happened to one of the nates alluded to in a previous note. Being divested of the protecting and embalming ingredient, by the process I there alluded to, this part has partially run into putrefaction, and emits the peculiar smell of animal substances, placed under similar circumstances. Nay, in the case of one of the large muscles of the thigh, and a large portion of the integument, which I similarly deprived of their protecting ingredients, such has been the rapidity with which putrefaction has followed, that although well covered, the vessels containing those parts emitted the most insufferable smell, and the parts themselves were found infested with myriads of large maggots.

stration of the various parts of this mummy, at the time it was first opened, excited amongst upwards of an hundred scientific and literary characters, who in the course of six weeks honoured me with their presence at my house to witness the dissection, and by whom I was encouraged to follow up the investigation, and to communicate the result to the public. It is in obedience to their suggestion, and more especially to the recommendation of the President of the Royal Society, that I have taken a comprehensive view of the whole subject, instead of limiting myself to the dry description of a solitary specimen.

Printed by W. Nicol,
Cleveland-row, St. James's.

